**Pascal EBNF Definition**

This document is an *Extended Backus-Naur Form* definition of the Pascal programming language.

**Categories of Syntactic Classes**

[Programs and Blocks](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#Programs%20and%20Blocks), [Procedure and Function Definitions](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#Procedure%20and%20Function%20Definitions), [Statements](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#Statements), [Expressions](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#Expressions), [Types](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#Types), [Record Fields](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#Record%20Fields), [Input/Output](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#Input/Output), [Variable and Identifier Categories](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#Variable%20and%20Identifier%20Categories), [Low Level Definitions](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#Low%20Level%20Definitions)

**Alphabetical List of Syntactic Classes**

* [actual-function](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#actual-function), [actual-parameter](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#actual-parameter), [actual-parameter-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#actual-parameter-list), [actual-procedure](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#actual-procedure), [actual-value](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#actual-value), [actual-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#actual-variable), [addition-operator](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#addition-operator), [array-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#array-type), [array-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#array-variable), [assignment-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#assignment-statement)
* [base-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#base-type), [block](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#block), [bound-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#bound-identifier), [bound-specification](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#bound-specification)
* [case-label-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#case-label-list), [case-limb](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#case-limb), [case-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#case-statement), [component-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#component-variable), [compound-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#compound-statement), [conditional-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#conditional-statement), [conformant-array-schema](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#conformant-array-schema), [constant](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#constant), [constant-definition](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#constant-definition), [constant-definition-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#constant-definition-part), [constant-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#constant-identifier)
* [declaration-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#declaration-part), [digit](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#digit), [digit-sequence](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#digit-sequence), [directive](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#directive)
* [element-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#element-list), [element-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#element-type), [entire-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#entire-variable), [enumerated-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#enumerated-type), [expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression), [expression-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression-list)
* [factor](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#factor), [field-designator](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#field-designator), [field-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#field-identifier), [field-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#field-list), [field-width](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#field-width), [file-buffer](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#file-buffer), [file-component-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#file-component-type), [file-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#file-type), [file-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#file-variable), [final-expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#final-expression), [fixed-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#fixed-part), [for-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#for-statement), [formal-parameter-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#formal-parameter-list), [formal-parameter-section](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#formal-parameter-section), [fraction-length](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#fraction-length), [function-body](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-body), [function-declaration](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-declaration), [function-designator](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-designator),[function-heading](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-heading), [function-identification](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-identification), [function-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-identifier), [function-parameter-section](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-parameter-section)
* [goto-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#goto-statement)
* [identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier), [identifier-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier-list), [if-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#if-statement), [index-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#index-type), [indexed-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#indexed-variable), [initial-expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#initial-expression), [integer-number](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#integer-number)
* [label](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#label), [label-declaration-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#label-declaration-part), [letter](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#letter), [lower-bound](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#lower-bound)
* [multiplication-operator](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#multiplication-operator)
* [number](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#number)
* [ordinal-type-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#ordinal-type-identifier), [output-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#output-list), [output-value](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#output-value)
* [packed-conformant-array-schema](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#packed-conformant-array-schema), [parameter-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#parameter-type), [pointer-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#pointer-type), [pointer-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#pointer-variable), [procedure-and-function-declaration-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-and-function-declaration-part), [procedure-body](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-body), [procedure-declaration](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-declaration), [procedure-heading](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-heading), [procedure-identification](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-identification), [procedure-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-identifier), [procedure-parameter-section](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-parameter-section), [procedure-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-statement),[program](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#program), [program-heading](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#program-heading)
* [real-number](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#real-number), [record-section](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#record-section), [record-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#record-type), [record-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#record-variable), [referenced-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#referenced-variable), [relational-operator](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#relational-operator), [repeat-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#repeat-statement), [repetitive-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#repetitive-statement), [result-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#result-type)
* [scale-factor](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#scale-factor), [set](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#set), [set-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#set-type), [sign](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#sign), [simple-expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#simple-expression), [simple-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#simple-statement), [simple-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#simple-type), [statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement), [statement-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement-part), [statement-sequence](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement-sequence), [string](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#string), [string-character](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#string-character), [structured-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#structured-statement), [structured-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#structured-type), [subrange-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#subrange-type)
* [tag-field](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#tag-field), [term](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#term), [type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type), [type-definition](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type-definition), [type-definition-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type-definition-part), [type-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type-identifier)
* [unpacked-conformant-array-schema](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#unpacked-conformant-array-schema), [unpacked-structured-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#unpacked-structured-type), [unsigned-digit-sequence](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#unsigned-digit-sequence), [upper-bound](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#upper-bound)
* [value-parameter-section](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#value-parameter-section), [variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable), [variable-declaration](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable-declaration), [variable-declaration-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable-declaration-part), [variable-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable-identifier), [variable-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable-list), [variable-parameter-section](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable-parameter-section), [variant](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variant), [variant-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variant-part)
* [while-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#while-statement), [with-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "with-statement)

**Definitions of Syntactic Classes**

**Programs and Blocks**

program

[program-heading](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#program-heading) [block](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#block) "."

program-heading

**program** [identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier) "(" [identifier-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier-list) ")" ";"

block

[declaration-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#declaration-part) [statement-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement-part)

declaration-part

[ [label-declaration-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "label-declaration-part) ]  
[ [constant-definition-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "constant-definition-part) ]  
[ [type-definition-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "type-definition-part) ]  
[ [variable-declaration-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "variable-declaration-part) ]  
[procedure-and-function-declaration-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-and-function-declaration-part)

label-declaration-part

**label** [label](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#label) { "," [label](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#label) } ";"

constant-definition-part

**const** constant-definition ";" { constant-definition ";" }

constant-definition

[identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier) "=" [constant](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#constant)

type-definition-part

**type** [type-definition](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type-definition) ";" { [type-definition](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type-definition) ";" }

type-definition

[identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier) "=" [type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type)

variable-declaration-part

**var** [variable-declaration](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable-declaration) ";" { [variable-declaration](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable-declaration) ";" }

variable-declaration

[identifier-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier-list) ":" [type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type)

procedure-and-function-declaration-part

{ ([procedure-declaration](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "procedure-declaration) | [function-declaration](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-declaration)) ";" }

procedure-declaration

[procedure-heading](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-heading) ";" [procedure-body](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-body) |  
[procedure-heading](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-heading) ";" [directive](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#directive) |  
[procedure-identification](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-identification) ";" [procedure-body](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-body)

procedure-body

[block](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#block)

function-declaration

[function-heading](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-heading) ";" [function-body](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-body) |  
[function-heading](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-heading) ";" [directive](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#directive) |  
[function-identification](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-identification) ";" [function-body](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-body)

function-body

[block](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#block)

directive

**forward** | compiler-defined-directives

statement-part

**begin** [statement-sequence](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement-sequence) **end**

**Procedure and Function Definitions**

procedure-heading

**procedure** [identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier) [ [formal-parameter-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#formal-parameter-list) ]

function-heading

**function** [identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier) [ [formal-parameter-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#formal-parameter-list) ] ":" [result-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#result-type)

result-type

[type-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type-identifier)

procedure-identification

**procedure** [procedure-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-identifier)

function-identification

**function** [function-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-identifier)

formal-parameter-list

"(" [formal-parameter-section](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#formal-parameter-section) { ";" [formal-parameter-section](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#formal-parameter-section) } ")"

formal-parameter-section

[value-parameter-section](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#value-parameter-section) |  
[variable-parameter-section](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable-parameter-section) |  
[procedure-parameter-section](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-parameter-section) |  
[function-parameter-section](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-parameter-section)

value-parameter-section

[identifier-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier-list) ":" [parameter-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#parameter-type)

variable-parameter-section

**var** [identifier-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier-list) ":" [parameter-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#parameter-type)

procedure-parameter-section

[procedure-heading](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-heading)

function-parameter-section

[function-heading](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-heading)

parameter-type

[type-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type-identifier) | [conformant-array-schema](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#conformant-array-schema)

conformant-array-schema

[packed-conformant-array-schema](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#packed-conformant-array-schema) |  
[unpacked-conformant-array-schema](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#unpacked-conformant-array-schema)

packed-conformant-array-schema

**packed** **array** "[ " [bound-specification](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#bound-specification) " ]" **of** type-idnetifier

unpacked-conformant-array-schema

**array** "[ " [bound-specification](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#bound-specification) { ";" [bound-specification](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#bound-specification) } " ]"  
**of** ([type-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type-identifier) | [conformant-array-schema](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#conformant-array-schema))

bound-specification

[identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier) ".." [identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier) ":" [ordinal-type-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#ordinal-type-identifier)

ordinal-type-identifier

[type-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type-identifier)

**Statements**

statement-sequence

[statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement) { ";" [statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement) }

statement

[ [label](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "label) ":" ] ([simple-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#simple-statement) | [structured-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#structured-statement))

simple-statement

[ [assignment-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "assignment-statement) | [procedure-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-statement) | [goto-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "goto-statement) ]

assignment-statement

([variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable) | [function-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-identifier)) ":=" [expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression)

procedure-statement

[procedure-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-identifier) [ [actual-parameter-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#actual-parameter-list) ]

goto-statement

**goto** [label](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#label)

structured-statement

[compound-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#compound-statement) | [repetitive-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#repetitive-statement) | [conditional-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#conditional-statement) | [with-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#with-statement)

compound-statement

**begin** [statement-sequence](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement-sequence) **end**

repetitive-statement

[while-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#while-statement) | [repeat-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#repeat-statement) | [for-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#for-statement)

while-statement

**while** [expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression) **do** [statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement)

repeat-statement

**repeat** [statement-sequence](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement-sequence) **until** [expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression)

for-statement

**for** [variable-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable-identifier) ":=" [initial-expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#initial-expression) (**to** | **downto**) [final-expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#final-expression) **do** [statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement)

initial-expression

[expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression)

final-expression

[expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression)

conditional-statement

[if-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#if-statement) | [case-statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#case-statement)

if-statement

**if** [expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression) **then** [statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement) [ **else** [statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement) ]

case-statement

**case** [expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression) **of**  
[case-limb](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#case-limb) { ";" [case-limb](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#case-limb) } [ ";" ]  
**end**

case-limb

[case-label-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#case-label-list) ":" [statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement)

case-label-list

[constant](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#constant) { "," [constant](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#constant) }

with-statement

**with** [record-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#record-variable) { "," [record-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#record-variable) } **do** [statement](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#statement)

actual-parameter-list

"(" [actual-parameter](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#actual-parameter) { "," [actual-parameter](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#actual-parameter) } ")"

actual-parameter

[actual-value](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#actual-value) | [actual-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#actual-variable) | [actual-procedure](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#actual-procedure) | [actual-function](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#actual-function)

actual-value

[expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression)

actual-procedure

[procedure-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#procedure-identifier)

actual-function

[function-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-identifier)

**Expressions**

expression

[simple-expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#simple-expression) [ [relational-operator](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#relational-operator) [simple-expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#simple-expression) ]

simple-expression

[ [sign](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "sign) ] [term](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#term) { [addition-operator](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#addition-operator) [term](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#term) }

term

[factor](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#factor) { [multiplication-operator](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#multiplication-operator) [factor](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#factor) }

factor

[variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable) | [number](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#number) | [string](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#string) | [set](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#set) | **nil** | [constant-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#constant-identifier) | [bound-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#bound-identifier) | [function-designator](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-designator) | "(" [expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression) ")" | **not** [factor](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#factor)

relational-operator

"=" | "<>" | "<" | "<=" | ">" | ">=" | "in"

addition-operator

"+" | "-" | **or**

multiplication-operator

"\*" | "/" | **div** | **mod** | **and**

variable

[entire-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#entire-variable) | [component-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#component-variable) | [referenced-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#referenced-variable)

entire-variable

[variable-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable-identifier) | [field-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#field-identifier)

component-variable

[indexed-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#indexed-variable) | [field-designator](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#field-designator) | [file-buffer](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#file-buffer)

indexed-variable

[array-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#array-variable) "[ " [expression-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression-list) " ]"

field-designator

[record-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#record-variable) "." [field-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#field-identifier)

set

"[ " [element-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#element-list) " ]"

element-list

[ [expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "expression) { "," [expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression) } ]

function-designator

[function-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#function-identifier) [ [actual-parameter-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#actual-parameter-list) ]

file-buffer

[file-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#file-variable) "^"

**Types**

type

[simple-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#simple-type) | [structured-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#structured-type) | [pointer-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#pointer-type) | [type-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type-identifier)

simple-type

[subrange-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#subrange-type) | [enumerated-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#enumerated-type)

enumerated-type

"(" [identifier-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier-list) ")"

subrange-type

[lower-bound](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#lower-bound) ".." [upper-bound](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#upper-bound)

lower-bound

[constant](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#constant)

upper-bound

[constant](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#constant)

structured-type

[ **packed** ] [unpacked-structured-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#unpacked-structured-type)

unpacked-structured-type

[array-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#array-type) | [record-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#record-type) | [set-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#set-type) | [file-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#file-type)

array-type

**array** "[ " [index-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#index-type) { "," [index-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#index-type) } " ]" **of** [element-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#element-type)

index-type

[simple-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#simple-type)

element-type

[type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type)

record-type

**record** [field-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#field-list) **end**

set-type

**set** **of** [base-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#base-type)

base-type

[type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type)

file-type

**file** **of** [file-component-type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#file-component-type)

file-component-type

[type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type)

pointer-type

"^" [type-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "type-identifier)

**Record Fields**

field-list

[ ([fixed-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "fixed-part) [ ";" [variant-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variant-part) ] | [variant-part](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variant-part)) [ ";" ] ]

fixed-part

[record-section](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#record-section) { ";" [record-section](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#record-section) }

record-section

[identifier-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier-list) ":" [type](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type)

variant-part

**case** [tag-field](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#tag-field) [type-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#type-identifier) **of** [variant](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variant) { ";" [variant](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variant) }

tag-field

[ [identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "identifier) ":" ]

variant

[case-label-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#case-label-list) ":" "(" [field-list](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#field-list) ")"

**Input/Output**

output-list

[output-value](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#output-value) { "," [output-value](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#output-value) }

output-value

[expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression) [ ";" [field-width](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#field-width) [ ":" [fraction-length](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#fraction-length) ] ]

field-width

[expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression)

fraction-length

[expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression)

**Variable and Identifier Categories**

identifier

[letter](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#letter) { [letter](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#letter) | [digit](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#digit) }

file-variable

[variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable)

referenced-variable

[pointer-variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#pointer-variable) "^"

record-variable

[variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable)

pointer-variable

[variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable)

actual-variable

[variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable)

array-variable

[variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable)

field-identifier

[identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier)

constant-identifier

[identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier)

variable-identifier

[identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier)

type-identifier

[identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier)

procedure-identifier

[identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier)

function-identifier

[identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier)

bound-identifier

[identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier)

**Low Level Definitions**

variable-list

[variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable) { "," [variable](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#variable) }

identifier-list

[identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier) { "," [identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#identifier) }

expression-list

[expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression) { "," [expression](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#expression) }

number

[integer-number](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#integer-number) | [real-number](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#real-number)

integer-number

[digit-sequence](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#digit-sequence)

real-number

[digit-sequence](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#digit-sequence) "." [ [digit-sequence](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "digit-sequence) ] [ [scale-factor](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "scale-factor) ] |  
[digit-sequence](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#digit-sequence) [scale-factor](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#scale-factor)

scale-factor

("E" | "e") [ [sign](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "sign) ] [digit-sequence](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#digit-sequence)

unsigned-digit-sequence

[digit](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#digit) { [digit](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#digit) }

digit-sequence

[ [sign](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "sign) ] [unsigned-digit-sequence](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#unsigned-digit-sequence)

sign

"+" | "-"

letter

"A" | "B" | "C" | "D" | "E" | "F" | "G" | "H" | "I" | "J" | "K" | "L" | "M" | "N" | "O" | "P" | "Q" | "R" | "S" | "T" | "U" | "V" | "W" | "X" | "Y" | "Z" | "a" | "b" | "c" | "d" | "e" | "f" | "g" | "h" | "i" | "j" | "k" | "l" | "m" | "n" | "o" | "p" | "q" | "r" | "s" | "t" | "u" | "v" | "w" | "x" | "y" | "z"

digit

"0" | "1" | "2" | "3" | "4" | "5" | "6" | "7" | "8" | "9"

string

"'" [string-character](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#string-character) { [string-character](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "string-character) } "'"

string-character

any-character-except-quote | "''"

label

[integer-number](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#integer-number)

constant

[ [sign](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html" \l "sign) ] ([constant-identifier](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#constant-identifier) | [number](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#number)) | [string](https://www.fit.vutbr.cz/study/courses/APR/public/ebnf.html#string)